

## A Framework for Government Agency Quality Management Systems

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Government agency efficiency, transparency, effectiveness, and trustworthiness are regularly in the news, more for lack of these attributes than for examples of where they exist. While this is often unfair, it does point out the need for agencies at all levels to develop and implement management systems which are more reliable, fair, effective and consistent in serving the public. The phrase “quality management system” (QMS), however, can be confusing, since the applicability of a QMS to a government agency has not been clearly defined. What is needed is an understanding of the accomplishment of the agency’s mission in terms of a mission realization lifecycle, at which point the QMS can be translated into language that can be understood in the context of government services. This paper provides the mission realization lifecycle framework, followed by a description of the relationship between QMS concepts and the respective functions of agency management.

The question of how to establish an effective, efficient management system framework is relevant to both agencies that manage according to an ISO standard with additional regulatory requirements, as well as to agencies that operate in a mainly regulatory context and are in need of an overall management framework. The natural flow of management processes can be charted such that a QMS can support this natural flow, rather than add the burden of more “red tape”. The lifecycle framework that is used by systems engineering<sup>1</sup> can be extrapolated for government services to provide this mission realization framework, and once that is established, a relevant QMS can be extrapolated from ISO 9001: 2015<sup>2</sup>. This mission realization lifecycle framework can be used to manage the agency apart from any political philosophy and is scalable to agencies and departments of varying sizes. Once the mission realization lifecycle framework and the supporting QMS are established, the processes can then be audited and improved. Mallory’s *Systems Management Standard* and *Process Management Standard*<sup>3</sup> can be used to assess the relative maturity and effectiveness of the systems and processes, as an option if conventional compliance audits are not a good fit at the outset.

For government, as well as the private sector, the process begins with Stakeholder Expectations, i.e., the Agency’s Mission as defined by the Executive and Legislative branches of government, and the citizens. Whether it is benefits, rockets, highways, safety, security, or tax collection, the Agency answers a need for the public good. This top level need or expectation must then be broken down (“decomposed”) into its constituent parts and processes: a service that

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<sup>1</sup> NPR. 7123.1 *NASA Systems Engineering Processes and Requirements*  
<http://nodis3.gsfc.nasa.gov/displayDir.cfm?t=NPR&c=7123&s=1B>

<sup>2</sup> ISO 9001, *Quality Management Systems-Requirements*; International Organization for Standardization; Geneva, Switzerland, 2015.

<sup>3</sup> Mallory, Richard E., *Quality Standards for Highly Effective Government*, Trafford Publishing, 2014, pp. 17, 42-43.

is performed “by whom, to or for whom, what, where, when and how”. These questions are answered by the process of defining the overall mission specifics and the design solution in terms of scope, personnel, qualifications, training, infrastructure, equipment, forms, interface with the public or other agencies, budgets, schedules, priorities, agency governance, processes and regulations.

The services which meet stakeholder expectations (e.g. safety, security, or weather predictions) are then realized through personnel, equipment and infrastructure using systems and processes, accompanied in some cases by “products” (tangible items such as roads, national parks, rockets, satellites). These clearly defined processes are required for consistent, efficient, effective and fairly implemented services, and this is often where government agencies fall short of meeting the expectations of the citizenry. A purely regulatory approach, or implementation of the various quality tools such as Lean or Six Sigma, by themselves, will not provide the overall framework needed for complete lifecycle management, and benefits gained from process improvements, while significant, will be localized. Similarly, performance metrics are useful for assessment and analysis, but will not, by themselves provide a complete framework.

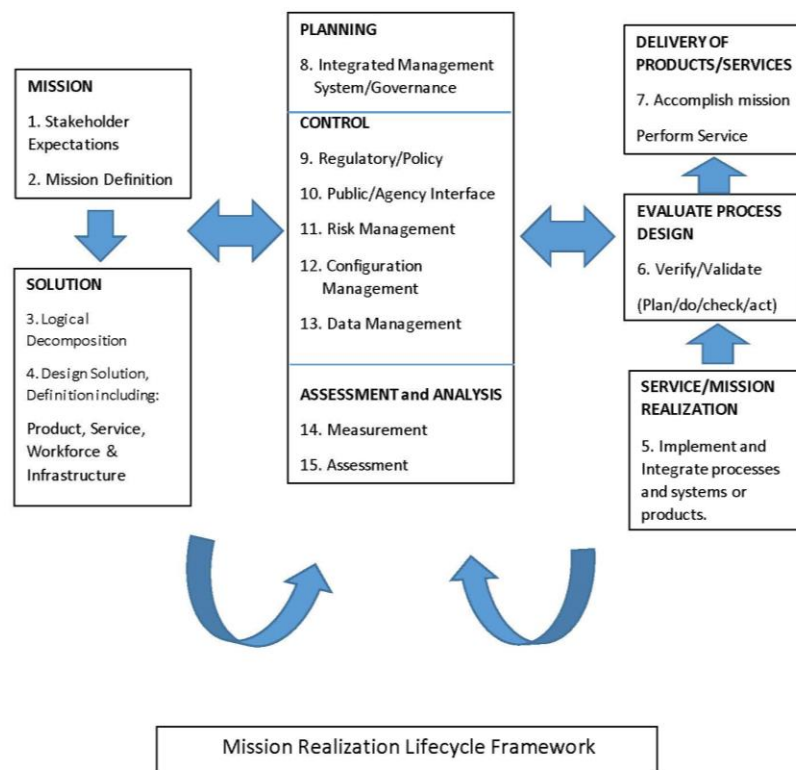


Figure 1

Due to budgetary and time constraints, service delivery to the public happens all too often in conjunction with verification and validation that the service is both: 1) performed correctly (verification); and 2) that it is the correct service (validation). Disciplined decomposition and definition processes, along with the integrated planning and control processes, would serve to

produce better products and services in their initial implementation, and would gain credibility for the agency as a whole. Continual improvement processes such as plan-do-check-act cycles or Lean can be used to identify the necessary adjustments, and more effective implementation of risk management would serve to identify weaknesses and threats in the mission realization processes and infrastructure.

The framework for identifying mission requirements, and for designing, and implementing processes and services is managed through the Agency's management or governance system. It is here under management planning and control that the regulatory environment fits into the framework, similar to technical requirements for a product. Regulations define much of the technical aspects- the "to whom, by and for whom, what, where, when and how"- of the mission. Like product specifications, regulations do not by themselves provide a management framework, rather they define inputs, outputs and expected results. This can, however, be considered an integrated management system, in that it combines all of the various "management systems" that are outlined in standards, policies and regulations. (Many regulations affect a broad number of agencies, such as Occupational Safety and Health Administration (OSHA), Department of Transportation (DOT), or Environmental Protection Agency (EPA). For example, in addition to science and space exploration, NASA must comply with OSHA safety regulations for employees, EPA regulations at the field centers, and DOT regulations for shipping rocket motors.) The policy and governance process will manage supporting processes for: compliance with regulations and agency policy; infrastructure and workforce; acquisition; risk; configuration of the service process; management of the data collected; and analysis of the data. The various projects/programs that are managed by the agency will have their own lifecycle apart from the upper level agency governance.

The processes are further defined below:

### **Mission Realization Lifecycle**

#### **Mission Definition, Solution, Delivery**

**Stakeholder Expectations:** General direction as identified by the executive and legislative branches of government, outlined in appropriations; expectations of the citizenry.

**Mission Definition:** Specifics of how the stakeholder expectations will be met, including types of programs, products and services. (Projects/Programs will follow their own lifecycle.)

**Logical Decomposition:** The mission definition is further "decomposed" (broken down) into contributing projects, products and services.

**Design Solution Definition:** The programs, projects, products and services are further defined in terms of infrastructure, processes, equipment, personnel, forms, and data.

**Service/Mission Realization:** Establishment and implementation of operations; integration of functions; performance of mission; acquisitions; processes.

**Verify & Validate (V&V):** Plan-Do-Check-Act; Design-Measure-Analyze-Implement-Control, Lean, Earned Value Management; is it the right service and is it being done correctly. (V&V as appropriate to the situation)

**Accomplish the Mission:** Complete the process of delivering on the agency's mission, vision, goals, products, services.

## **Planning and Control**

**Integrated Management and Governance:** Strategy, organization, communication.

**Policy/Regulatory Management:** Management of the Agency's mission through compliance with applicable regulations, statutes, policies. These "technical requirements" inform the design of operations, products and services, and guide decision making; are flowed down to suppliers, employees and the public.

**Interface Management:** Implement, manage and control interface with other departments, agencies and stakeholders.

**Risk Management:** Systematic identification of risks and their mitigations; taking action to eliminate, mitigate or transfer risk; ensure that new initiatives are successful and that new risks for existing initiatives are identified in time.

**Configuration Management:** Ensure that configuration of products, processes, and infrastructure is identified and controlled to achieve consistent, fair, efficient and effective results.

**Data Management:** Ensuring that the data collected from the public and for the service/product delivery is safeguarded; is accurate and readily retrievable.

**Assessment:** Status and performance review of: programs, projects, products, services, infrastructure, fulfillment of strategy and goals. Make necessary adjustments.

**Decision Analysis:** Management Review of assessment data and subsequent decisions

Once this lifecycle is understood as a management framework, the ISO quality management standards can be translated to further define how the relevant processes can be managed in a systematic way. The regulatory and policy aspects of the agency's mission fit into the planning and control aspects of governance, and form the integrated management system. With this framework in mind, the QMS as applied to a government agency begins to make sense by looking at the intent of the requirement rather than the product realization terminology. ISO 18091, *Quality management systems –Guidelines for the application of ISO 9001:2008 in local government*<sup>4</sup>, discusses at length the ISO requirements as they apply to local governments. However, the standard still uses terminology associated with the private sector, such as "design and development" or "control of production and service provision", which remain difficult to translate into government mission realization concepts without a solid background in ISO. Figure 2 simplifies the translation of these concepts, although it should be noted that the focus should be on the development and implementation of a system of processes that are appropriate to the agency, which can then be improved upon; and not to become stymied at the outset by the ISO terminology. ISO 9001:2015 has some new terminology which is less product oriented and is

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<sup>4</sup> ISO 18091, *Quality management systems –Guidelines for the application of ISO 9001:2008 in local government*, International Organization for Standardization, Geneva, Switzerland, 2014.

somewhat easier to correlate to public sector processes. This terminology has been incorporated in Figure 2.

With the mission realization lifecycle in mind, we can see that customers and “interested parties” are the natural stakeholders of the agency (executive, legislative, public). The agency’s mission is further defined in terms of requirements and process design, and implementation or delivery of the products and services that the agency is chartered to provide. As with the private sector, planning and control take on great significance and these planning and control processes are the means by which the agency manages risk, responds to changing situations, adapts to policies, collects performance metrics, and achieves the desired strategy. With management commitment and consistent implementation, the agency can achieve the fair, consistent, effective and efficient service that the stakeholders expect. Keeping current with policy and regulations, and ensuring that they are implemented is analogous to configuration control, and data management is becoming increasingly vital to government operations.

The interrelationships of these processes are so crucial, as best illustrated by Figure 1, that if any one of them is not fully formed and implemented, all others will be less than optimum. Likewise, poor design and implementation, or failure to implement, any aspect of the QMS that applies to the situation at hand, will also result in less than optimum performance of the entire management lifecycle, if not ultimate failure of service delivery. When understood as a complete lifecycle, the various processes can be more effectively designed and implemented and improved to achieve mission success.

<b>Management Lifecycle</b>	<b>ISO 9001:2015 Requirement</b>
Stakeholder Expectations	Needs and Expectations of Interested Parties; Customer Focus; Customer Communication
Mission Definition	Requirements for Products and Services
Logical Decomposition	Design and Development Planning/Inputs
Design Solution Definition	Design and Development Outputs; Resources; Organizational Knowledge
Service Implementation	Design and Development Controls; Control of Production and Service Provision
Service Integration	Control of Externally Provided Processes, Products and Services
Service Verification	Design and Development Controls (verification activities)
Service Validation	Design and Development Controls (validation activities)
Service Delivery	Release of Products and Services; Post Delivery Activities
Management and Governance	Operational and Planning Control; Leadership and Commitment; Policy; Planning; Understanding the Organization and its Context; Quality Management System
Regulatory & Policy Management; Acquisition	Design and Development Planning/Inputs; Control of Externally Provided Processes, Products and Services
Interface Management	Control of Externally Provided Processes, Products and Services
Risk Management	Actions to Address Risks and Opportunities
Configuration Management	Design and Development Changes; Changes to Requirements; Identification and Traceability; Control of Changes; Control of Nonconforming Outputs
Data Management	Documented Information; Control of Documented Information; Control of Changes
Assessment	Performance Evaluation; Monitoring, Measurement, Analysis and Evaluation; Internal Audits
Decision Analysis	Management Review

**Figure 2**

## References

ISO 9001, *Quality Management Systems-Requirements*; International Organization for Standardization; Geneva, Switzerland, 2015.

ISO 18091, *Quality management systems –Guidelines for the application of ISO 9001:2008 in local government*, International Organization for Standardization, Geneva, Switzerland, 2014.

ISO 31000, *Risk management-Principles and guidelines*, International Organization for Standardization, Geneva Switzerland, 2009.

NPR. 7123.1 *NASA Systems Engineering Processes and Requirements*  
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Mallory, Richard E., *Quality Standards for Highly Effective Government*, Trafford Publishing, 2014, pp. 17; 42-43.